# Reflexive Aero Structures for Enhanced Survivability, Phase I

Completed Technology Project (2005 - 2005)

## Project Introduction

Cornerstone Research Group Inc. (CRG) proposes to develop an advanced reflexive structure system to increase the survivability of aerostructures. This reflexive system will mimic the pain withdrawal reflex on which the human body relies. The proposed reflexive system will incorporate a continuous health and performance monitoring system via an embedded dielectric film, an adaptive composite structure based on CRG's shape memory composite material (Veritex

TM

), and an intelligence system which will be interfaced with both the health/performance sensors and the adaptive structure. When activated, Veritex

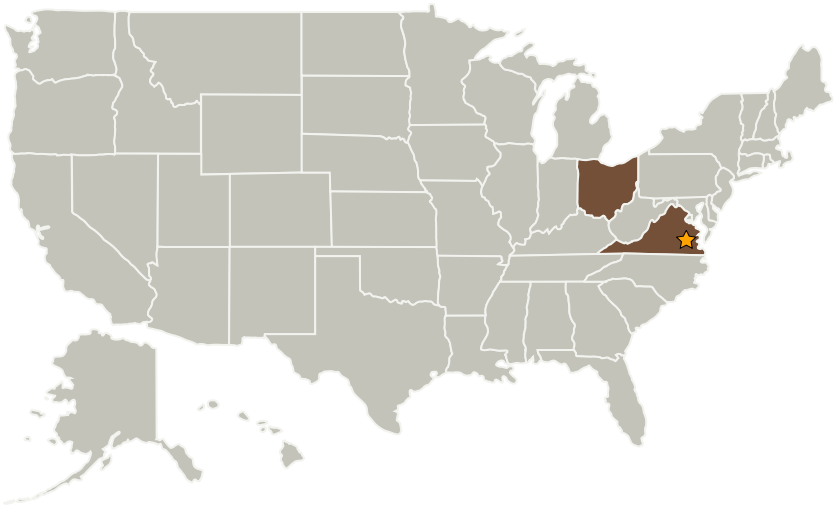
TM

will recover its structural integrity via shape recovery and a novel healing process. These features enable the use of Veritex

TM

as an adaptive structure in the proposed reflexive system. The development of a reflexive system for aerostructures will enable increased safety and security and demonstrate a better understanding of integrated performance systems. This reflexive technology could find immediate implementation on all current and future UCAV systems and future implementation on platforms such as the International Space Station, Lunar, and Martian habitats.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Langley Research Center(LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| Cornerstone Research Group, Inc. | Supporting Organization | Industry | Miamisburg, Ohio |

| Primary U.S. Work Locations | |
|---|---|
| Ohio | Virginia |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Benjamin A Dietsch

## Technology Areas

**Primary:**

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.3 Surface Construction and Assembly